

Remarks

By this response, claim 13 has been amended. No new matter has been entered as support for the amendments is provided for by the specification, claims, and drawings as originally filed. Accordingly, claims 13-27, 29-32, 35 and 41 are pending in this application.

Claim Objections

In the current Office Action, claim 1 is objected to due to informalities. Applicants respectfully point out that claim 1 was previously canceled in the Applicants' Amendment on August 16, 2005 in response to a restriction requirement. Applicants assume that the Examiner is currently referring to claim 13 and the Applicants have amended claim 13 to correct the informality. Accordingly, this objection to the claim has been overcome by the above amendments.

Claim Rejections - 35 USC § 103

Claims 13-22, 31 and 41 are rejected as being unpatentable over Grehier et al (US 4,037,023) in view of McLean (US 6,544,681). Applicants respectfully traverse.

Claim 13 recites a device comprising an electrochemical cell comprising a membrane electrode assembly defining an anode side of said cell and a cathode side of said cell. The cell also comprises a first flow field plate for the cathode side of the cell. The first flow field plate comprising a plurality of first channels separated by first lands wherein the plurality of first channels and first lands run between a first set of fluid manifolds. Further the cell comprises a second flow field plate for the anode side of said cell. The second flow field plate comprising a plurality of second channels separated by second lands wherein the plurality of second channels and second lands run between a second set of fluid manifolds. The membrane electrode assembly is interposed between the first and second flow field plates. A pitch is defined by the first flow field plate is less than a pitch defined by the second flow field plate. At least one of the first lands and at least one of the second lands are each provided in a pattern of alternating angles and crests in a plane parallel to both of the flow field plates. The pattern of the first lands and the pattern of the second lands are orientated relative to each other across the membrane electrode assembly such that the first and second lands crisscross along the alternating angles and overlap

on the crests. The pitch of each the first and second flow field plates is constant between the first and second sets of fluid manifolds.

Greheir discloses a fuel cell formed from a stack of electrodes. However, Greheir fails to disclose a pitch defined by the first flow field plate that is less than a pitch defined by the second flow field plate and where the pitch is constant between the first and second sets of fluid manifolds. Instead, Greheir discloses the same pitch for both flow field plates (see Fig. 9). In addition Greheir teaches that "the edges of the electrodes of the electrodes are advantageously deformed" so that "these edges have a greater spacing than the electrochemically active portions of the electrodes" (see Col. 4, lines 48-51, Figs. 10 and 11). Therefore, the pitch of the flow field plates is not constant along the length of the plates.

Examiner admits Greheir fails to teach that a pitch defined by one flow field plate is greater than a pitch of the other, or any details outlined in the above listed dependent claims with regards to the pitch and the cross-sectional dimensions, or that the fuel cell is a proton exchange membrane fuel cell and cites McLean. However, McLean fails to remedy the deficiencies of Greheir. McLean discloses a double sided corrugated flow field plate for use in fuel cells. However, McLean also fails to disclose a pitch defined by the first flow field plate that is less than a pitch defined by the second flow field plate and where the pitch is constant between the first and second sets of fluid manifolds. Instead, McLean discloses incorporating channel couplings on the surface of the corrugated flow field plate by pressing down on selected lands by 50% to provide fluid communication between the channel and its adjacent channel (see col. 4, lines 53-57; col. 9, line 66 through Col. 11, line 3; Figs 4, 7, 8; Figs. 9 and 10, elements 160, 161, 163 and 165). According to McLean, depressing the lands results in a reduction of manufacturing costs (see Col. 10, lines 56-60). However, the depression of certain lands results in change of the pitch at the ends of the flow field plate. Consequently, the pitch, in McLean, is not constant between the first and second sets of fluid manifolds. Therefore, neither Greheir nor McLean disclose these limitations in the claimed invention.

Nor does the hypothetical combination of Greheir and McLean suggest or teach a pitch defined by the first flow field plate that is less than a pitch defined by the second flow field plate, and where the pitch is constant between the first and second sets of fluid manifolds. Because the hypothetical combination of Greheir and McLean does not suggest or teach all the limitations of

the claimed invention, Applicants believe that claim 13 is patentable over the prior art and request the Examiner withdraw his rejection to claim 13.

Claims 14-22, 31 and 41 depend from the independent claims 13 either directly or ultimately. These dependent claims are patentable for the same reasons as presented above with respect to the claim from which they depend. Therefore, Applicants assert that claims 14-22, 31 and 41 are also patentable over the prior art and request that the Examiner withdraw his rejection thereof.

Claims 23-27, 29, 30, 32 and 35 are rejected as being unpatentable over Grehier et al in view of McLean as applied to claim 13 above, and further in view of Suzuki (US 2002/0004158). Applicants respectfully traverse.

Claims 23-27, 29, 30, 32 and 35 depend from the independent claim 13 either directly or ultimately. These dependent claims are patentable for the same reasons as presented above with respect to the claim from which they depend. Therefore, Applicants assert that claims 23-27, 29, 30, 32 and 35 are also patentable over the prior art and request that the Examiner withdraw his rejection thereof.

Conclusion

In view of the above amendments and remarks, Applicants respectfully submit that the present application is in condition for allowance. The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,
Dinsmore & Shohl, LLP

By /Kristina E. Swanson/
Kristina E. Swanson
Registration No. 53,657

One Dayton Centre
One South Main Street, Suite 1300
Dayton, Ohio 45402-2023
Telephone: (937) 449-6400
Facsimile: (937) 449-6405

Serial No.: 10/669,479

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e-mail: kristina.swanson@dinslaw.com

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